

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-8 and 21-28 are pending in the present application. Claims 1, 4, and 6 are amended, Claims 9-20 are canceled without prejudice, and Claims 21-28 are added by the present amendment.

In the outstanding Office Action, Claims 9-20 were withdrawn from consideration; the title was objected to; Claims 1, 7, and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsang (U.S. Patent No. 6,864,551) in view of Wallace (U.S. Patent No. 6,143,634); and Claims 2-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsang, Wallace and Van de Walle (Microscopic Theory of Hydrogen in Silicon Devices, IEEE Transactions on Electron Devices, vol. 47, no. 10, October 2000).

Regarding the objection to the title, a new title that is believed to be more indicative of the claimed invention is presented. No new matter has been added. Accordingly, it is respectfully requested this objection be withdrawn.

Regarding the rejection of Claims 1, 7, and 8 under 35 U.S.C. § 103(a) as unpatentable over Tsang in view of Wallace, Claim 1 is amended to more clearly recite "the gate electrode being formed of polysilicon containing deuterium atoms." The claim amendment finds support in the specification at page 24, lines 9-16. No new matter has been added.

Briefly recapitulating, independent Claim 1 is directed to a magnetic random access memory that includes, *inter alia*, a silicon substrate and a transistor which has a gate electrode formed on the silicon substrate via a gate insulating film. The gate electrode is formed of polysilicon containing deuterium atoms. In a non-limiting example, Figure 16 shows the silicon substrate 11, the transistor 15, and the gate electrode 53a.

The claimed magnetic random access memory advantageously achieves an increased resistance to degradation of the transistor because the majority of dangling bonds in the gate electrode are terminated by Si-D bonds, as disclosed in the specification at page 26, lines 4-15.

Turning to the applied art, Tsang shows in Figure 5A a magnetic memory having a substrate 202 and a transistor having a gate electrode 215. However, Tsang does not teach or suggest that the gate electrode 215 is formed of polysilicon containing deuterium atoms as required by amended Claim 1. In addition, the outstanding Office Action recognizes that Tsang “fails to show that the substrate is made of silicon and that silicon-deuterium bonds terminate some of the dangling bonds in the substrate.”¹

The outstanding Office Action relies on Wallace for teaching hydrogen passivating of dangling bonds in a substrate and also the use of deuterium instead of hydrogen. However, Wallace does not teach or suggest that a gate electrode 220 of a transistor shown in Figure 2 is formed of polysilicon containing deuterium atoms as required by amended Claim 1. In addition, Wallace only focuses on dangling bonds in a substrate terminated by deuterium anneal and does not teach or suggest including deuterium atoms in the gate electrode 220.

Accordingly, it is respectfully submitted that neither Tsang nor Wallace teaches or suggests a gate electrode formed of polysilicon and containing deuterium atoms. Therefore, it is respectfully submitted that independent Claim 1 and each of the claims depending therefrom patentably distinguish over Tsang and Wallace, either alone or in combination.

New Claims 21-28 have been added to set forth the invention in a varying scope and Applicant respectfully submits the new claims are supported by the originally filed specification (for example, see page 28, line 20, to page 29, line 4 and page 32, lines 3-5). In particular, new Claim 21 is directed to a magnetic random access memory that includes,

¹ Outstanding Office Action, page 3, last full paragraph.

besides the features of Claim 1, a silicon nitride film containing deuterium atoms and the film is formed on an upper surface and side surfaces of the gate electrode. Claims 22-28 depend from independent Claim 21.

In a non-limiting example, Figure 21 shows the substrate 11, the transistor 15, and the silicon nitride film 71.

Tsang does not teach or suggest any layer having silicon nitride containing deuterium atoms. In addition, Wallace does not teach or suggest a silicon nitride film containing deuterium atoms. As discussed above, Wallace focuses only on dangling bonds in a substrate terminated by a deuterium anneal method.

Accordingly, it is respectfully submitted that independent Claim 21 and each of the claims depending therefrom patentably distinguish over Tsang and Wallace, either alone or in combination.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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